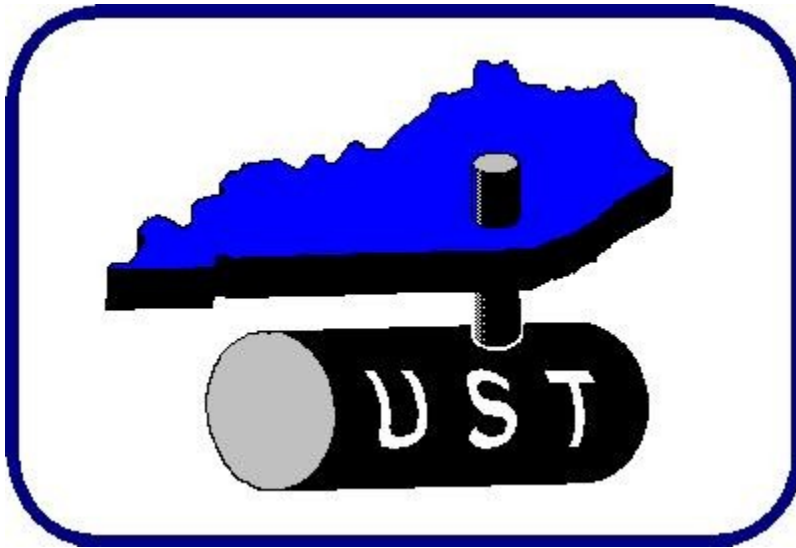


## CLOSURE OUTLINE



**ENERGY AND ENVIRONMENT CABINET  
DIVISION OF WASTE MANAGEMENT  
UNDERGROUND STORAGE TANK BRANCH  
200 FAIR OAKS LANE, 2ND FLOOR  
FRANKFORT, KENTUCKY 40601  
502-564-5981**

**AUGUST 2006**

# **CLOSURE OUTLINE**

**Energy and Environment Cabinet  
Division of Waste Management  
Underground Storage Tank Branch  
200 Fair Oaks Lane, 2<sup>nd</sup> Floor  
Frankfort, Kentucky 40601  
502-564-5981**

## **1.0 INTRODUCTION**

This outline identifies requirements for permanent closure of underground storage tank (UST) systems, including protocols for sampling soil and/or water to assess UST facilities in accordance with 401 KAR 42:070.

The requirements for notification and for submission of information to the UST Branch are applicable to every permanent closure of a regulated UST system. The cabinet reserves the right to require additional information or sampling in order to clarify permanent closure documentation.

If analytical results from closure activities indicate that site investigation activities will be necessary, all sections of this outline shall be completed prior to the cabinet issuing a written directive to initiate the site investigation process.

Costs related to the removal, or actions incidental to the removal of a UST system, after the effective date of this administrative regulation, are not eligible for reimbursement from Petroleum Storage Tank Environmental Assurance Fund, except as authorized under 401 KAR 42:330 (Small Owners Tank Removal Account). Actions incidental to the removal include, but are not limited to, the disposal of tank contents, collection of hydrogeologically downgradient groundwater samples as described in Section 4.3, the disposal of water or free product in the excavation zone during permanent closure activities, the disposal and replacement of excavated backfill material within the excavation zone, and backfill subsidence repair within the excavation zone.

A suspected or confirmed release shall be reported immediately to the Environmental Response Team at 800-928-2380, or 502-564-2380. The Incident Number assigned to the release report shall be included in the Closure Assessment Report.

For definitions of terms used within this outline, refer to 401 KAR 42:005.

### **1.1 Regulated Petroleum UST Systems**

This document shall be used in conjunction with the Classification Outline (August 2006), incorporated by reference in 401 KAR 42:080, which specifies actions and allowable constituent levels in soil and groundwater for permanent closure of regulated petroleum UST systems.

Requirements for additional documentation of closure activities (beyond those presented in this document) are presented in the Classification Outline (August 2006).

### **1.2 Regulated Non-Petroleum UST Systems**

UST facilities with regulated non-petroleum UST systems shall conduct soil and water sampling in accordance with Sections 3.0 and 4.0 of this outline. Section 5.0 shall be followed for sample analysis requirements although, as indicated in Tables A and B, the UST Branch shall be contacted for required methods, detection limits, and allowable constituent levels for soil and groundwater.

### **1.3 UST Systems Not Regulated under 401 KAR Chapter 42**

Closure requirements for UST systems that are not regulated under 401 KAR Chapter 42 may be obtained by contacting the Superfund Branch or the Hazardous Waste Branch at 502-564-6716.

## **2.0 PERMANENT CLOSURE PROCESS**

The permanent closure process records all activities associated with the permanent closure of regulated UST systems and requires the submission of specific documentation to the UST Branch. Required forms, appendices, and addenda submitted shall be complete and accurate, and all information submitted shall comply with the following requirements:

- Include the Agency Interest number on each document submitted. If the number is unknown, contact the UST Branch, Administrative Section, at 502-564-5981; and
- Submit the original and one (1) copy of each required document. An original signature shall be included on all Department for Environmental Protection (DEP) forms.

### **2.1 Notice of Intent**

The permanent closure process shall begin with the submission of a completed Notice of Intent (NOI) to Permanently Close UST System (DEP7114/01/06) to the Division of Waste Management regional office serving the county where the UST system will be permanently closed. This form shall be submitted a minimum of two weeks (14 calendar days) prior to the permanent closure of a UST system(s). The NOI shall only be valid for twelve (12) months following signature by the tank owner or operator or their authorized representative. Owners and operators failing to submit this form prior to permanent closure will not be eligible for reimbursement in accordance with 401 KAR 42:250.

A listing of the Division of Waste Management regional offices may be obtained by contacting the Field Operations Branch at 502-564-6716 or at <http://www.waste.ky.gov>.

### **2.2 Regional Office Inspection**

At least two weeks (14 calendar days) prior to permanent closure, the owner or operator shall schedule an on-site closure inspection by contacting the regional office serving the area where the UST system will be closed. Owners and operators failing to schedule an inspection with the regional office prior to permanent closure will not be eligible for reimbursement in accordance with 401 KAR 42:250. The function of the regional office inspector is to observe and document activities at the site during permanent closure or subsequent site inspections.

### **2.3 UST Systems Tank Removal Contractor Certification Program**

Effective April 1, 1991, in accordance with 815 KAR 30:060, permanent closure of any UST system shall be performed by a certified underground petroleum storage tank removal contractor. The State Fire Marshal's (SFM) office administers this certification program. Anyone performing removal or closure-in-place of a UST system shall be certified by the SFM program, and proof of certification shall be supplied, upon request, to Division of Waste Management (DWM) representatives. The contractor's name, company name, and SFM certification number shall be indicated on the Closure Assessment Report (DEP8055/01/06).

For more information or for a list of certified underground storage tank removal contractors, contact the SFM office at 502-573-0364.

## **2.4 Closure Assessment Report (CAR)**

The CAR Form (DEP8055/01/06) shall be signed by a Professional Engineer (P.E.) registered with the Kentucky Board of Licensure for Professional Engineers and Land Surveyors, or a Professional Geologist (P.G.) registered with the Kentucky Board of Registration for Professional Geologists and shall be submitted to the UST Branch within ninety (90) days following the permanent closure of a UST system. The completed CAR shall include a narrative description of permanent closure activities.

## **2.5 Site Map**

Provide a detailed site-specific map. The site map shall illustrate tank and piping locations, all sampling locations, depth of all tank pits, optional soil removal (if applicable), property boundaries, adjacent properties, any other pertinent features at the site, and indicate any areas where future sampling would be prohibited. The map shall also include all underground utility lines (to scale, indicating the type of service and depth of each line). The map shall be to scale and include a north arrow and legend.

## **2.6 Evacuation of Tank Contents**

Tank contents shall be removed until the tank is “empty” as defined in 401 KAR 42:005 prior to excavation activities. Spillage from the tank(s) shall be reported in the Closure Assessment Report.

## **2.7 Optional Soil Removal Outside of the Excavation Zone**

In order to expedite the closure process, owners and operators may remove contaminated soil outside of the excavation zone up to 382 cubic meters (500 cubic yards) in accordance with the following procedures for each tank pit and associated piping trench.

- Upon removal of the material from the excavation zone, samples shall be collected in accordance with Section 3.1.
- If analytical results indicate soil contamination above the allowable levels as determined by completion of the Classification Guide DEP8056/01/06, excavation of 190 cubic meters (250 cubic yards) may proceed followed by sampling of the newly excavated wall, floor, or piping trench in accordance with Section 3.1.
- If analytical results indicate contamination above allowable levels, soil removal may continue until soil exhibits levels below allowable levels or until a total of 382 cubic meters (500 cubic yards) have been removed. Confirmatory samples shall be collected from the newly excavated wall, floor, or piping trench in accordance with Section 3.1.
- Eligible reimbursement shall be made on the basis of analytical results verifying the need for additional soil removal and shall be limited to 382 cubic meters (500 cubic yards) for each tank pit and associated piping trench. See 401 KAR 42:250 Section 15 (j).
- Documentation regarding optional soil removal at the time of closure shall include all subsequent soil removal up to 382 cubic meters (500 cubic yards), and shall be included in the Closure Assessment Report.

NOTE: If water is encountered during the optional soil removal activities outside of the excavation zone, which would require pumping to allow for further over-excavation, the optional removal activities shall cease. Any water removal outside of the excavation zone must be directed in writing by the cabinet in order to be reimbursable in accordance with 401 KAR 42:250.

### **3.0 SOIL SAMPLE COLLECTION REQUIREMENTS**

UST facilities with regulated petroleum UST systems shall collect soil samples in accordance with this section if so prescribed in the Classification Outline (August 2006).

Sampling shall be conducted in accordance with 40 CFR 260.11, specifically per "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (United States (US) Environmental Protection Agency (EPA) Publication SW-846 (US EPA SW-846)) to ensure that a representative sample is collected. Soil samples shall be collected with a corer, a trowel, or a similar instrument (preferably made of stainless steel). If safety conditions warrant, samples may be obtained from a backhoe bucket. Recognized methods, in accordance with US EPA Standard Operating Procedures, shall be followed for decontamination of all sampling equipment. For information about the Standard Operating Procedures, contact the US EPA, Region IV, Science and Ecosystem Support Division, 980 College Station Road, Athens, Georgia 30605 or call 706-355-8500.

The following steps shall be followed for collection of soil samples from the tank pit and piping trench areas:

1. All preparations for soil sampling shall be made prior to excavation activities.
2. When removing the tank(s) or piping, backfill material shall be excavated. Once all backfill material has been removed to the original limits of the tank pit and/or piping trench, excavation activities shall cease and initial soil samples shall be collected from the excavation zone.
3. Sampling locations within the excavated areas shall not be exposed for more than 4 hours prior to sample collection. Soil samples shall be collected in accordance with Sections 3.1, 3.2, and 3.3.
4. Soil samples shall be properly preserved. Provide a summary of sample collection, handling, and preservation.

For information on interim corrective action or corrective action technologies that address elevated contamination levels in the soil and groundwater, refer to the Corrective Action Plan Outline (August 2006) incorporated by reference in 401 KAR 42:060.

Upon collection of samples, soil borings shall be properly plugged, bottom to top, in a manner to prevent communication of surface water and groundwater or communication between two (2) or more water-bearing zones through the boring.

#### **3.1 Soil Sampling: Tank or Piping Removed from the Ground**

The following subsections outline the procedures for the collection of representative samples from the tank pit and piping trench areas of UST systems to be removed from the ground. Refer to Section 3.0 for sampling procedures. Figure A illustrates locations for sample collection as discussed in the following three (3) subsections. If soil samples cannot be collected as described, see Section 3.4 for deviations from sampling requirements. Tank pits or piping trenches excavated into bedrock (e.g., blasted, hoe-rammed, etc.) shall be reported in the CAR narrative.

##### **3.1.1 Tank Pit Walls**

Each 7.60-meter (twenty-five (25) feet) section of each tank pit wall shall be sampled in the following manner:

- Grid each 7.60-meter (twenty-five (25) feet) section of the tank pit wall as shown in Figure A;
- Collect one (1) composite soil sample for laboratory analysis consisting of a grab sample from each of the four (4) quadrants of the 7.60-meter (twenty-five (25) feet) section;
- Grab samples shall be collected where contamination is most likely to be present; and
- A minimum of one sample shall be collected from each tank pit wall. If a tank pit wall is greater than 7.60 meters in length, a separate composite soil sample shall be collected from each section (up to 7.60 meters) exceeding the initial 7.60 meters (twenty-five (25) feet).

### **3.1.2 Tank Pit Bottom**

Each 7.60-meter (twenty-five (25) feet) section of the tank pit bottom shall be sampled in the following manner:

- Grid each 7.60-meter (twenty-five (25) feet) section of the tank pit bottom as shown in Figure A;
- Collect one (1) composite soil sample for laboratory analysis consisting of a grab sample from each of the four (4) quadrants of the 7.60-meter (twenty-five (25) feet) section;
- Grab samples shall be collected where contamination is most likely to be present; and
- A minimum of one sample shall be collected from the tank pit bottom. If a tank pit bottom is greater than 7.60 meters in length, a separate composite soil sample shall be collected from each section (up to 7.60 meters) exceeding the initial 7.60 meters (twenty-five (25) feet).

If bedrock is encountered and a bottom sample is not collected, refer to Section 4.3 for requirements for the collection of downgradient groundwater samples.

To determine the proximity of groundwater to the pit bottom, a one-meter assessment as described in Section 4.2 of this outline shall be completed and reported for each tank pit.

### **3.1.3 Piping Trench**

Each 7.60-meter (twenty-five (25) feet) section of the piping trench shall be sampled in the following manner:

- Grid each 7.60-meter (twenty-five (25) feet) section of the piping trench as shown in Figure A. The area under the dispenser island is considered to be part of the piping trench and soil under the dispenser pad shall be assessed (the dispenser pad may have to be removed for required sampling); and
- Grab samples shall be collected where contamination is most likely to be present; and

- A minimum of one sample shall be collected from the piping trench. If the piping trench is greater than 7.60 meters in length, a separate composite soil sample shall be collected from each section (up to 7.60 meters) exceeding the initial 7.60 meters (twenty-five (25) feet). If applicable, the absence of a piping trench shall be explained in the narrative submitted with the report.

### **3.2 Soil Sampling: Tank or Piping Closed in Place**

The following subsections outline procedures for the collection of representative samples from the tank pit and piping trench areas of UST systems to be closed in place or for the resampling of tank pit and piping trench areas of previously closed UST systems that cannot be re-excavated. Figures B and C illustrate locations for sample collection as discussed in the following two (2) subsections. If soil samples cannot be collected as described, see Section 3.4 for deviations from sampling requirements.

#### **3.2.1 Tank Pit Area**

The following procedures shall be followed to assess the tank pit area. Figure B illustrates boring locations if one (1) UST system is to be closed in place. Figure C illustrates boring locations if more than one (1) tank is to be closed in place.

- Perform soil borings outside of the original limits of the tank pit at the ends and sides of each tank as shown in Figures B and C;
- Advance borings to a depth of at least 1 meter below the bottom of the tank. If bedrock is encountered in any boring prior to achieving the required depth, soil-bedrock interface samples shall be collected;
- A sample shall be collected from the boring at intervals of every 1 meter and evaluated using properly calibrated field instruments. Field instrumentation results and data documenting the proper operation and quality control procedures used during the operation of the field instrumentation shall be indicated in the narrative submitted with the report; and
- Select one (1) sample from each boring for laboratory analysis. This sample shall be from the location in the boring between the top of the tank and 1 meter below the bottom of the tank exhibiting the highest contaminant concentration using appropriate field methods (see paragraph above). If no contamination is exhibited throughout the boring using appropriate field methods, the sample from the bottom of the boring shall be submitted for analysis.

#### **3.2.2 Piping Trench Area**

Each 7.60-meter (twenty-five (25) feet) section of the piping trench shall be sampled in the following manner:

- Divide the piping trench length into 7.60-meter (twenty-five (25) feet) sections. The area under the dispenser island is considered to be part of the piping trench and soil under the dispenser pad shall be assessed; and
- Collect one (1) composite soil sample consisting of grab samples from the boring locations as illustrated in Figure B, for each 7.60-meter (twenty-five (25) feet) section. Samples shall be collected as close as possible to the piping, and borings shall

extend at least 1 meter below the bottom of the piping trench. In each sample collection location, sample(s) shall be collected from areas where contamination is most likely to be present.

- A minimum of one sample shall be collected from the piping trench. If the piping trench is greater than 7.60 meters in length, a separate composite soil sample shall be collected from each section (up to 7.60 meters) exceeding the initial 7.60 meters (twenty-five (25) feet). If applicable, the absence of a piping trench shall be explained in the narrative submitted with the report.

### **3.3 Sampling of Excavated Backfill Material**

When removing the tank(s) or piping, backfill material shall be excavated. Once all backfill material has been removed to the original limits of the excavation zone, as defined in 401 KAR 42:005, excavation activities shall cease and initial soil samples shall be collected from the excavated backfill material.

NOTE: If the excavated backfill material is disposed of at a permitted landfill or landfarming facility, additional sampling and analysis beyond that required by the permitted disposal facility shall not be required, except for facilities seeking reimbursement under 401 KAR 42:330 (Small Owners Tank Removal Account).

Excavated backfill material generated during the removal of the tank(s) or piping shall be placed on, and covered, with plastic. If the excavated backfill material is to be returned to the pit and there are no analytical results to document that the material is below allowable levels, the pit shall be lined with plastic. Measures shall be taken to prevent any surface runoff from entering or washing away the excavated backfill material (e.g., berms, straw bales, etc.). Copies of the laboratory analyses required by the permitted disposal facility shall be submitted as an appendix within the CAR.

At least one (1) composite sample shall be collected from the excavated backfill material removed from the tank pit and/or piping trench excavation zone. If the excavated backfill material is to be used for unrestricted off-site use, the material shall be sampled and analytical results shall be below the allowable levels for all constituents listed in Soil Table 3 of the Classification Outline (August 2006). If the excavated backfill material is to be treated off-site, contact the Solid Waste Branch, Division of Waste Management, 200 Fair Oaks Lane, 2<sup>nd</sup> Floor, Frankfort, KY 40601, or call 502-564-6716.

The excavated backfill material shall be sampled in the following manner:

- Divide the excavated backfill material into at least four (4) equal sections; and
- Collect one (1) composite soil sample consisting of a grab sample taken at least one (1) foot into the interior of each of the four (4) sections of each pile. Within each section the sample shall be collected from areas where contamination is most likely to be present.

Additional sampling as prescribed by the cabinet shall be performed if the excavated backfill material is improperly stored, if any degradation of plastic or runoff barriers occurs prior to disposal, or if any evidence of contamination is observed (e.g., fumes, odors, free product, etc.) peripheral to the excavated backfill material.

See Section 6.6 (Excavated Backfill Material) for additional sampling requirements if the excavated backfill material is to be returned to the excavation zone.

Open pit management and safety is the responsibility of the tank owner/operator during tank removal activities (or any site activity that involves soil removal).

### **3.4 Deviations from Sampling Requirements**

If soil samples cannot be collected in locations as described in Sections 3.1, 3.2, or 3.3 an original and one (1) copy of an alternative sampling plan proposal shall be submitted to the UST Branch. The alternative sampling plan shall include the following information:

- an explanation as to why the standard sampling requirements cannot be followed;
- a scaled schematic or drawing of proposed sampling points; and
- any other information supporting the proposed alternative sampling plan.

Prior written approval from the UST Branch shall be obtained before the proposed alternative sampling plan is implemented.

## **4.0 WATER SAMPLE COLLECTION REQUIREMENTS**

For water samples collected during permanent closure activities, all sample analyses with chain-of-custody (COC) documentation shall be submitted as an appendix within the CAR. All water samples shall be collected, handled, and preserved in a manner that reduces the loss of VOC (volatile organic compound) contamination and that follows SW-846 and Section 5 of this outline.

### **4.1 Water Encountered During Permanent Closure**

Once all backfill material has been removed, any water encountered in the excavation zone or closed-in-place borings during permanent closure activities shall be sampled, analyzed for the appropriate constituents, and removed (up to one pit volume). Any water or free product removed shall be properly disposed, if necessary, as prescribed in Section 6.5 of this outline (If reimbursement for proper disposal of water is sought in accordance with 401 KAR 42:330, water must be sampled and analyzed to prove contamination was above allowable levels). Measures shall be taken to prevent rainwater or surface water from entering the excavation zone or closed-in-place borings.

A description of water encountered during permanent closure activities shall be included in the CAR narrative. The description shall include a physical description (turbidity, odor, sheen, etc.), an estimate of the volume encountered (in gallons), and photographs of the water. If the water meets the definition of groundwater as defined in 401 KAR 42:005, the narrative shall include a discussion of how this determination was made (e.g., water was pumped from the tank pit or piping trench and recharge was observed).

### **4.2 One-Meter Assessment Requirements**

A one-meter assessment shall be conducted to determine the presence of groundwater. This assessment shall be completed to a depth of one meter below the bottom of the excavation zone or to the soil-bedrock interface if bedrock is encountered within one meter of the bottom of the excavation zone.

Water encountered within the excavation zone shall be managed as described in Section 4.1. Once the excavation zone is dewatered up to one pit volume, a one-meter assessment shall be conducted.

If water is encountered in the one-meter assessment, it shall be sampled and analyzed for the appropriate constituents.

If water is encountered in the one-meter assessment, water samples from domestic use wells, springs, and cisterns identified within a 100-meter radius of the UST system shall be sampled and analyzed for all appropriate constituents (including MTBE) listed in Table B.

### **4.3 Hydrogeologically Downgradient Groundwater Sampling**

A hydrogeologically downgradient groundwater sample shall be collected and analyzed for the appropriate constituents if the requirements of Sections 4.1 and 4.2 are not met. The groundwater samples shall be collected from the area most likely to be affected by a UST system release.

All monitoring well construction shall be conducted by a certified monitoring well driller and must be installed in accordance with the Site Investigation Outline (August 2006) incorporated by reference in 401 KAR 42:060. A copy of the Kentucky Monitoring Well Record Form (DEP8043) indicating the AKGWA Well Number shall be submitted for each monitoring well installed. For information about the Kentucky Monitoring Well Record Form (DEP8043), contact the cabinet's Division of Water at 200 Fair Oaks Lane, 4<sup>th</sup> Floor, Frankfort, Kentucky, 40601, or call 502-564-3410.

Assessment wells may be used to collect a groundwater sample in the hydrogeologically downgradient area most likely to be affected by a UST system release. Assessment wells will be considered temporary assessment points only and shall be decommissioned within thirty (30) days of construction (proper decommissioning is described in section 4.4 below). Assessment wells may be installed via conventional drill methods or via direct-push technology. Assessment wells shall be constructed in a manner to prevent communication of surface water and groundwater through the boring and to prevent communication between two or more water-bearing zones through the boring. If assessment wells are installed to assess groundwater, the installation shall be conducted by a certified monitoring well driller. A copy of the Kentucky Monitoring Well Record Form (DEP8043) indicating the AKGWA Well Number shall be submitted for each assessment well installed. For information about the Kentucky Monitoring Well Record Form (DEP8043), contact the cabinet's Division of Water at 200 Fair Oaks Lane, 4<sup>th</sup> Floor, Frankfort, Kentucky, 40601, or call 502-564-3410.

If assessment of groundwater in the hydrogeologically downgradient direction is required, discussion of the method of determination of groundwater flow direction shall be submitted. The direction of groundwater flow typically is determined by measuring static groundwater levels from three (3) locations in a triangular configuration. The documentation to support the hydrogeologically downgradient groundwater sample location shall include a site map depicting the exact locations of monitoring wells or assessment wells, the groundwater flow direction, and the hydraulic gradient. Site maps shall be to scale and shall include a north arrow and a legend. A table showing the top of casing, depth to water, groundwater elevation, and screened interval shall be submitted. A physical description of the hydrogeologically downgradient groundwater sample (turbidity, odor, sheen, etc.) shall be submitted.

If Sections 4.1 and 4.2 confirm the presence of groundwater with contamination above allowable levels, additional groundwater assessment may be required to determine the extent of contamination. The cabinet shall request additional groundwater assessment in writing.

### **4.4 Monitoring and Assessment Well Decommissioning**

Monitoring wells shall be properly decommissioned by a certified well driller within thirty (30) days of the date of determination that the monitoring well is unsuitable for use as a monitoring well or within thirty (30) days of receiving a no further action letter from the cabinet. Proper decommissioning of monitoring wells (and assessment wells) may be achieved by removing the casing and sealing the borehole with cement/bentonite or bentonite from bottom to top in a manner that prevents communication of surface water and groundwater through the well or boring and that prevents communication between two or more water-bearing zones through the well or boring. An amended copy of the Kentucky Monitoring Well Record Form (DEP8043) shall be submitted for each decommissioned monitoring well or assessment well. Questions regarding well decommissioning should be directed to the cabinet's Division of Water at 200 Fair Oaks Lane, 4<sup>th</sup> Floor, Frankfort, Kentucky, 40601, or call 502-564-3410.

## **5.0 SAMPLE ANALYSIS REQUIREMENTS**

Methods for sample collection, sample preservation, chain of custody (COC), sampling equipment, decontamination procedures, sample containers, sample sizes, and maximum sample holding times shall be conducted in accordance with 40 CFR 260.11, specifically, US EPA SW-846. All sample analyses with COC documentation shall be submitted to the UST Branch as an appendix within the CAR.

If more than one product was stored in a tank, samples shall be analyzed for all substances stored prior to permanent closure as identified in Table A and Table B.

### **5.1 Required Methods for Analysis of Soil Samples**

For regulated petroleum UST systems, analytical methods selected for determining compliance with the allowable levels specified in the Classification Outline (August 2006) shall be capable of accurately measuring the constituents at or below allowable levels. The maximum acceptable reporting limit, specified in Table A, is not necessarily the required action level for the particular constituent. The need to perform corrective action, or to continue with the performance of corrective action, shall be determined by the level of the constituent that may be allowed to remain under the requirements of the Classification Outline (August 2006).

Refer to Section 1.2 for requirements associated with non-petroleum regulated UST system(s).

### **5.2 Required Methods for Analysis of Water Samples**

For regulated petroleum UST systems, analytical methods selected for determining compliance with the allowable levels specified in the Classification Outline (August 2006) shall be capable of accurately measuring the constituents at or below allowable levels. The maximum acceptable reporting limit, specified in Table B, is not necessarily the required action level for the particular constituent. The need to perform corrective action, or to continue with the performance of corrective action, shall be determined by the level of the constituent that may be allowed to remain under the requirement of the Classification Outline (August 2006).

Refer to Section 1.2 for requirements associated with non-petroleum regulated UST system(s).

### **5.3 Additional Requirements**

#### **5.3.1 Sample Containers, Preservatives, Holding Times**

All samples collected shall be placed into appropriate containers, and requirements for preservation and holding times shall be followed. Table C is a limited summary of the appropriate containers, preservation techniques, and maximum holding times according to US EPA SW-846. Refer to SW-846 for additional information.

#### **5.3.2 Laboratory Reports**

All laboratory data sheets shall at a minimum indicate the:

- date of sample collection;
- date received by the laboratory;
- date analyzed;
- sample extraction date (if required);
- surrogate recovery percentages;
- US EPA SW-846 method number(s) used; and
- appropriate reporting limits;

All laboratory reports shall follow US EPA SW-846 requirements.

### **5.3.3 Chain of Custody**

A chain of custody (COC) is a history of the sample from the time of collection until its acceptance by a laboratory. This documentation shall be included with the results of all sample analyses submitted. COC procedures shall follow all US EPA SW-846 requirements. The COC shall indicate the preservation method and temperature received at the laboratory. If COC procedures are not followed, the integrity of the sample is compromised and the analysis invalidated.

## **6.0 REQUIREMENTS FOR THE DISPOSAL AND REUSE OF MATERIALS RESULTING FROM PERMANENT CLOSURE**

This section presents documentation requirements for the handling and disposal of various products and wastes that result from permanent closure activities. These products and wastes shall be handled and disposed of properly in accordance with 401 KAR Chapters 30-49 as applicable. If wastes are hazardous, additional requirements pertaining to disposal, manifesting, registration, etc. shall be addressed in accordance with 401 KAR Chapters 30-40 as applicable. For more information contact the Hazardous Waste Branch, Division of Waste Management, 200 Fair Oaks Lane, 2<sup>nd</sup> Floor, Frankfort, KY 40601, or call 502-564-6716.

All disposal documentation shall be submitted to the UST Branch as appendices within the CAR.

### **6.1 Tank Contents**

All tank contents are considered a waste unless they are transported directly to a permitted recycling facility, or unless the contents removed are product which can be used without any processing or treatment. If the recycling facility can only accept a portion of the tank contents (e.g., product/water mixture) removed from the tank, all unaccepted tank contents (e.g., accumulated water, product/water mixture, and bottom sediments) not accepted by a permitted recycling facility shall be considered a waste and subject to hazardous waste determination. A listing of permitted recycling facilities may be obtained by contacting the Hazardous Waste Branch, Division of Waste Management, 200 Fair Oaks Lane, 2<sup>nd</sup> Floor, Frankfort, KY 40601 or by calling 502-564-6716. Note that recycling does not include processing the tank contents through an oil/water separator.

Documentation of the proper handling of the tank contents shall include a receipt from the recycling facility that contains the following information:

- the agency interest number(s) designating the location of the UST system from which tank contents were removed;
- a complete description of the tank contents submitted for recycling;
- the amount of tank contents (gallons or pounds) submitted (per tank) for recycling; and
- the complete name and location of the receiving facility and all permit numbers of the receiving facility in effect the date tank contents were received.

### **6.2 Residual Tank Materials**

All residual tank materials are considered a waste and are subject to hazardous waste determination. The hazardous waste determination shall be conducted in accordance with 401 KAR 32:010, Section 2.

Hazardous wastes that are generated during permanent closure activities and removed from the site shall be disposed of at a permitted hazardous waste treatment, storage, or disposal (TSD) facility and, quantity dependent, shall be hauled by a registered hazardous waste transporter. Any site that generates hazardous waste during permanent closure activities shall register with the Hazardous Waste Branch of the Division of Waste Management and shall comply with the requirements of 401 KAR Chapter 32. For information about hazardous waste pretreatment requirements and accumulation time, certified hazardous waste transporters, permitted hazardous waste disposal facilities, and procedures for one-time generators contact the Hazardous Waste Branch, Division of Waste Management at 200 Fair Oaks Lane, 2<sup>nd</sup> Floor, Frankfort, Kentucky 40601 or call 502-564-6716.

If the materials are determined to be hazardous, documentation of proper transport and disposal shall include the following information:

- documentation of the hazardous waste determination conducted in accordance with 401 KAR 32:010, Section 2;
- a complete waste manifest (hazardous or non-hazardous as appropriate) including all required signatures and both the TSD's and generator's EPA ID numbers; and
- a receipt from the TSD which shall include the following information:
  - the agency interest number designating the location of the UST system from which residual tank materials were removed;
  - a complete description of the waste and the waste identification;
  - the exact volume of the waste generated (volume determines generator status); and
  - the complete name and location of the receiving facility and all permit numbers of the receiving facility in effect the date the residual tank materials were received.

If the materials are determined to be non-hazardous waste, documentation of proper disposal shall include the following information:

- documentation of the waste determination conducted in accordance with 401 KAR 32:010, Section 2, indicating the waste to be non-hazardous; and
- a complete non-hazardous waste manifest or receipt that contains the following details:
  - the agency interest number designating the location of the UST system from which residual tank materials were removed;
  - a complete description of the waste;
  - the volume of the waste generated; and
  - the complete name and location of the receiving facility and all permit numbers of the receiving facility in effect the date residual tank materials were received.

### **6.3 Cleaning Liquids and Cleaning Materials**

Any liquid or solid material used to clean a UST system, whether relating to removal or closure in place, is considered a waste and subject to hazardous waste determination. Refer to Section 6.2 for general information on waste determination, transportation, and disposal.

#### **6.4 Tank or Piping Disposal**

Documentation of the disposal of a removed tank(s) or piping shall include the following information:

- If the tank(s) or piping is disposed of at a scrap metal company or a landfill, a receipt from the receiving facility shall be submitted. This receipt shall be signed by the receiving facility and shall include the receiving facility's name, address, and phone number, as well as the name of the site, the Agency Interest number, the location address, the number of tank(s) or piping, and the size of the tank(s) (if applicable);
- If the tank(s) or piping is not disposed of at a scrap metal company or a permitted landfill, a bill of sale from the individual or facility receiving the tank or piping shall be submitted. This bill of sale shall indicate that the individual or facility accepts responsibility for the tank or piping and acknowledges that its use will be in compliance with regulatory requirements. This document shall be signed by the individual or facility receiving the tank or piping and shall indicate the receiving individual or facility name, address, and telephone number, as well as the Agency Interest number of the site where the tank or piping was removed and a listing of all content(s) stored at any time in the tank(s). If an empty UST is sold and transported to an off-site facility, the receiving facility may become a generator of hazardous waste if and when any remaining residues are removed from the UST. A suggested model of a bill of sale is included as Figure D.
- If the tank(s) is to be reused as an aboveground tank for storage of a flammable substance, a permit of approval from the State Fire Marshal's (SFM) office is required. Applications for this permit will be considered by the SFM if the tank manufacturer provides information confirming the structural integrity of the tank(s) for use as an aboveground storage tank. Contact the SFM at 502-573-0364 regarding the application for reuse of a UST as an aboveground storage tank; or
- If the tank(s) is to be reused for any other purpose, contact the SFM office at 502-573-0364.
- For tanks closed in place, indicate the type of inert solid (e.g., sand, concrete) used to fill the tank after any emptying or cleaning.
- For piping closed in place, indicate that the piping has both ends capped after any emptying or cleaning.

In accordance with the American Petroleum Institute (API) Recommended Practice 1604, removed tanks must not be used for drainage culverts or the subsequent storage of food or liquids intended for animal or human consumption.

If a UST removed from the ground is not to be cleaned at the location where the UST was removed, the UST shall be empty as defined in 401 KAR 42:005. Figure E illustrates the minimum requirements of a certification that shall be completed and submitted to the UST Branch if a UST is removed from a site prior to cleaning. If an empty UST is sold and transported to an off-site facility, the receiving facility may become a generator of hazardous waste if and when any remaining residues are removed from the UST.

#### **6.5 Water Encountered in Excavation Zone**

Water encountered in the excavation zone during removal of the tank(s) or piping shall be properly disposed in one of the following manners:

- If the treated water is to be discharged (e.g., storm sewer, drainage ditch, etc.) rather than taken to a registered facility, submit a copy of the one-time Kentucky Pollutant Discharge Elimination System (KPDES) water discharge permit obtained from the Industrial Synfuel Section of the Kentucky Division of Water. For more information call the Division of Water at 502-564-3410;
- If the water is recovered by a permitted facility, submit a receipt from the receiving facility; or
- If the water from the excavated pit is to be disposed of by discharging into the sanitary sewer system, submit a copy of the letter of approval or permit issued by the sewer district.

Any permit, receipt, or letter documenting the disposal of contaminated water shall include the amount of water disposed of, Agency Interest number of the site from which the water originated, and any analytical results required for disposal.

## **6.6 Excavated Backfill Material**

The Classification Outline (August 2006) provides information regarding excavated backfill material generated during permanent closure of petroleum UST systems.

Reuse of excavated backfill material treated off-site (e.g., landfarming, thermal soil desorption, etc.) shall be analyzed for BTEX, PAH and Total Lead. Analytical results shall be below the appropriate levels established in the Classification Outline (August 2006) prior to replacement of any treated backfill material to the excavation zone. Laboratory data sheets shall be included in the Closure Assessment Report.

Reuse of excavated backfill material treated on-site (e.g., landfarming) shall be analyzed for the appropriate constituents listed in Table A. Analytical results shall be below the appropriate levels established in the Classification Outline (August 2006) prior to replacement of any treated backfill material to the excavation zone. Laboratory data sheets shall be included in the Closure Assessment Report.

Submit documentation (e.g., weigh tickets, waste manifest) indicating the amount of excavated backfill material accepted by a disposal facility (e.g., landfill or landfarm). See Section 3.3 (Sampling of Excavated Backfill Material) for additional sampling requirements, if the excavated backfill material is to be returned to the excavation zone or used for an unrestricted off-site purpose. To obtain a list of approved landfills and/or landfarms that accept contaminated soil in Kentucky, contact the Solid Waste Branch, Division of Waste Management, 200 Fair Oaks Lane, 2<sup>nd</sup> Floor, Frankfort, Kentucky 40601 or call 502-564-6716.

Excavated backfill material generated during the permanent closure of regulated UST systems containing substances other than petroleum products is subject to a hazardous waste determination.

## **7.0 Other Considerations**

- Refer to the Classification Outline (August 2006), which is incorporated by reference in 401 KAR 42:080 for additional information.
- The owner/operator/contractor/consultant bears the responsibility of exploring, identifying and addressing all potential safety hazards throughout the course of their work.
- For information about the Kentucky Monitoring Well Record form (DEP8043) or decommissioning of monitoring wells, contact the Groundwater Branch, Division of Water, 200 Fair Oaks Lane, 4<sup>th</sup> Floor, Frankfort, Kentucky 40601 or call 502-564-3410.



## Table A

### Analytical Requirements for Soil Samples

Product stored in UST system	Required Analysis	Acceptable Method	Maximum Acceptable Reporting Limit
Gasoline, Kerosene, or Jet Fuel	BTEX	Method 5030 in conjunction with SW-846 8240, 8260, 8020, 8021	B: <0.01 ppm T: <0.7 ppm E: <0.9 ppm X: <5.0 ppm
Diesel or regulated Heating Oil	PAH	Method 3540 or 3550 in conjunction with SW-846 8100, 8270, or 8310	Ch: <15 ppm B(a)A: <0.15 ppm c PAH: <0.3 ppm n PAH: <3.0 ppm NAP: <1.0 ppm
Waste Oil	PAH	Method 3540 or 3550 in conjunction with SW-846 8100, 8270, or 8310	Ch: <15 ppm B(a)A: <0.15 ppm c PAH: <0.3 ppm n PAH: <3.0 ppm NAP: <1.0 ppm
	Total Lead	SW-846 7420, 7421, or 6010	Total Lead <50 ppm
New Oil	PAH	Method 3540 or 3550 in conjunction with SW-846 8100, 8270, or 8310	Ch: <15 ppm B(a)A: <0.15 ppm c PAH: <0.3 ppm n PAH: <3.0 ppm NAP: <1.0 ppm
Other Petroleum or Non-Petroleum	Contact the UST Branch		

BTEX: Benzene, Toluene, Ethylbenzene, and Xylene (total)  
 PAH: Polynuclear Aromatic Hydrocarbons  
 Ch: Allowable level individually for Chrysene  
 B(a)A: Allowable level individually for Benzo(a)anthracene  
 c PAH: Maximum Acceptable Reporting Limit Individually for Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene  
 n PAH: Maximum Acceptable Reporting Limit Individually for Acenaphthene, Acenaphthylene, Anthracene, Benzo(ghi)perylene, Fluoranthene, Fluorene, Phenanthrene and Pyrene  
 NAP: Naphthalene  
 ppm: parts per million (mg/kg)

## Table B

### Analytical Requirements for Water Samples

Product stored in UST system	Required Analysis	Acceptable Method	Maximum Acceptable Reporting Limit
Gasoline, Kerosene, or Jet Fuel	BTEX	Method 5030 in conjunction with SW-846 8240, 8260, 8020, 8021	B: <0.005 ppm T: <1.0 ppm E: <0.7 ppm X: <10.0 ppm
Diesel or regulated Heating Oil	c PAH n PAH NAP	Method 3510 or 3520 in conjunction with SW-846 8100, 8270, or 8310	c PAH: <0.005 ppm n PAH: <3.0 ppm NAP: <0.3 ppm
Waste Oil	PAH	Method 3510 or 3520 in conjunction with SW-846 8100, 8270, or 8310	c PAH: <0.005 ppm n PAH: <3.0 ppm NAP: <0.3 ppm
	Total Lead	SW-846 7420, 7421, or 6010	Total Lead < 0.015 ppm
New Oil	c PAH n PAH NAP	Method 3510 or 3520 in conjunction with SW-846 8100, 8270, or 8310	c PAH: <0.005 ppm n PAH: <3.0 ppm NAP: <0.3 ppm
*	MTBE	Method 5030 in conjunction with SW-846 8240, 8260, 8020, 8021	MTBE <0.005 ppm
Other Petroleum or Non-Petroleum	Contact the UST Branch		

BTEX: Benzene, Toluene, Ethylbenzene, and Xylene (total)  
 PAH: Polynuclear Aromatic Hydrocarbons  
 c PAH: Maximum Acceptable Reporting Limit Individually for Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene  
 n PAH: Maximum Acceptable Reporting Limit Individually for Acenaphthene, Acenaphthylene, Anthracene, Benzo(ghi)perylene, Fluoranthene, Fluorene, Phenanthrene and Pyrene  
 NAP: Naphthalene  
 \*MTBE: MTBE analysis/reporting for domestic use sources  
 ppm: parts per million (mg/L)

**Table C**

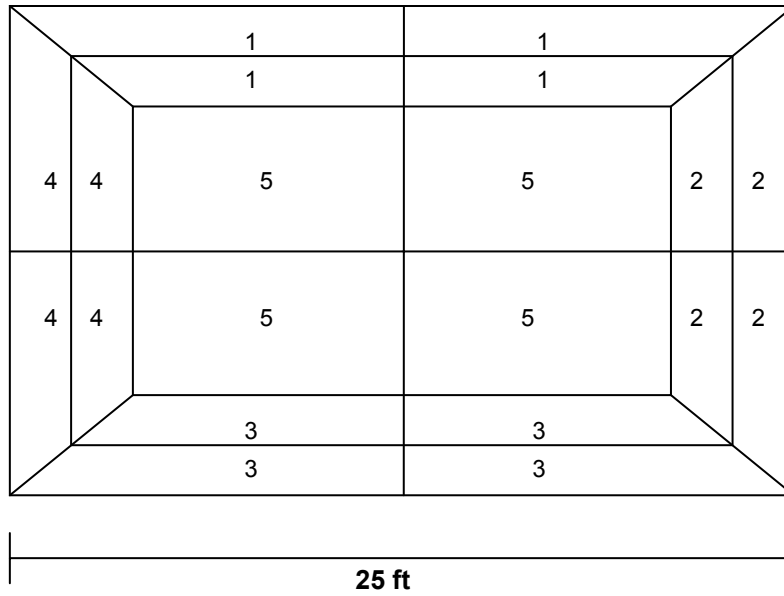
**Appropriate Containers, Sample Sizes,  
Preservation Techniques and Maximum Holding Times\***

Parameter	Container type	Sample Size	Preservation Method	Holding Times (Maximum)
Volatile Organics for Soil (BTEX)	Wide-mouth glass w/ Teflon-lined cap	120 ml or 4 oz.	Cool to 4°C	14 days
Volatile Organics for Water (BTEX; MTBE)	Two (2) clear glass w/ Teflon-lined cap (VOA)	40 ml or 1oz.	Add four drops of HCl to ea., Cool to 4°C	14 days
Polynuclear Aromatic Hydrocarbons for Soil (PAH)	Wide-mouth glass w/ Teflon-lined cap	250 ml or 1oz.	Cool to 4°C	14 days until lab extraction 40 days after lab extraction
Polynuclear Aromatic Hydrocarbons for Water (PAH)	Amber glass w/ Teflon-lined cap	1 liter	Cool to 4°C	7 days until lab extraction 40 days after lab extraction
Total Lead for Soil	Wide-mouth glass w/ Teflon-lined cap	500 ml or 16 oz.	N/A	180 days
Total Lead for Water	Plastic or glass	500 ml or 16 oz.	Add HNO <sub>3</sub> until pH is less than 2, cool to 4°C	180 days
Volatile Organics for Sludge (TCLP)	Wide-mouth glass w/ Teflon-lined cap	120 ml or 4 oz.	Cool to 4°C	14 days until lab extraction 14 days after lab extraction
Acid/Base/Neutral for Sludge(TCLP)	Wide-mouth glass w/ Teflon-lined cap	120 ml or 4 oz.	Cool to 4°C	14 days (hold) 7 days until lab extraction 40 days after lab extraction
Metals for Sludge(TCLP)	Wide-mouth glass w/ Teflon-lined cap	500 ml or 16 oz.	Cool to 4°C	180 days until lab extraction 180 days after lab extraction
Mercury for Sludge(TCLP)	Wide-mouth glass w/ Teflon-lined cap	500 ml or 16 oz.	Cool to 4°C	28 days until lab extraction 28 days after lab extraction

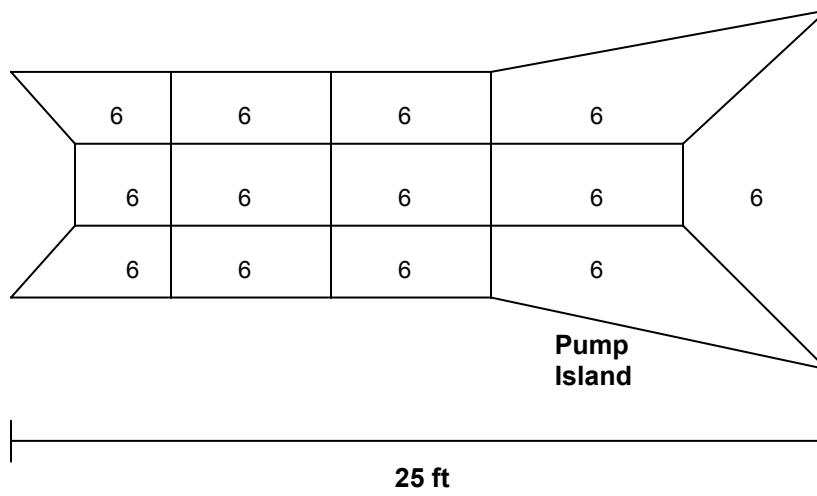
\* FOR FURTHER INFORMATION REFER TO US EPA SW-846 PUBLICATION.

**Figure A**

**Soil Sample Locations - Tank or Piping Removed from Ground**



**Tank Pit**

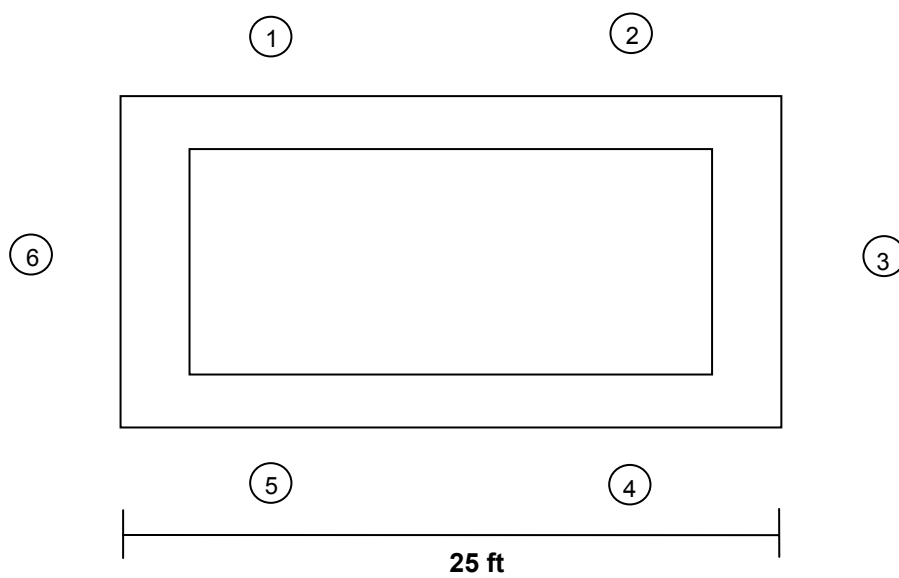


**Pump  
Island**

**Piping Trench**

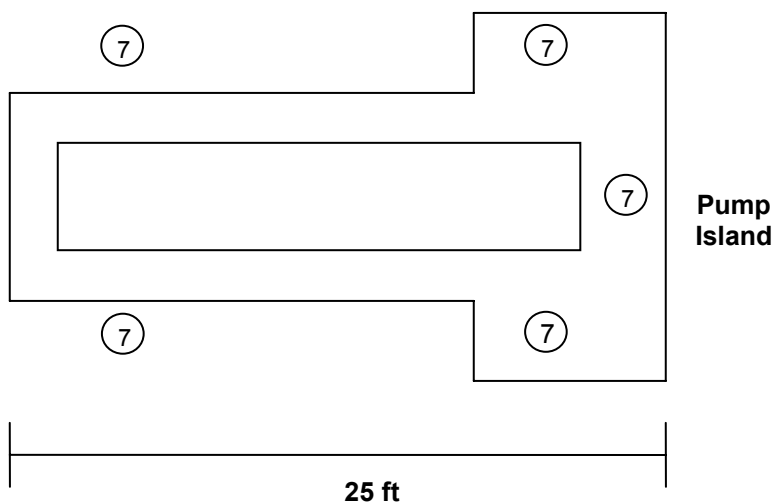
**1 - Grab sample location**

**Figure B**  
**Soil Sample Locations - Single Tank or Piping Closed in Place**



**Tank Pit**

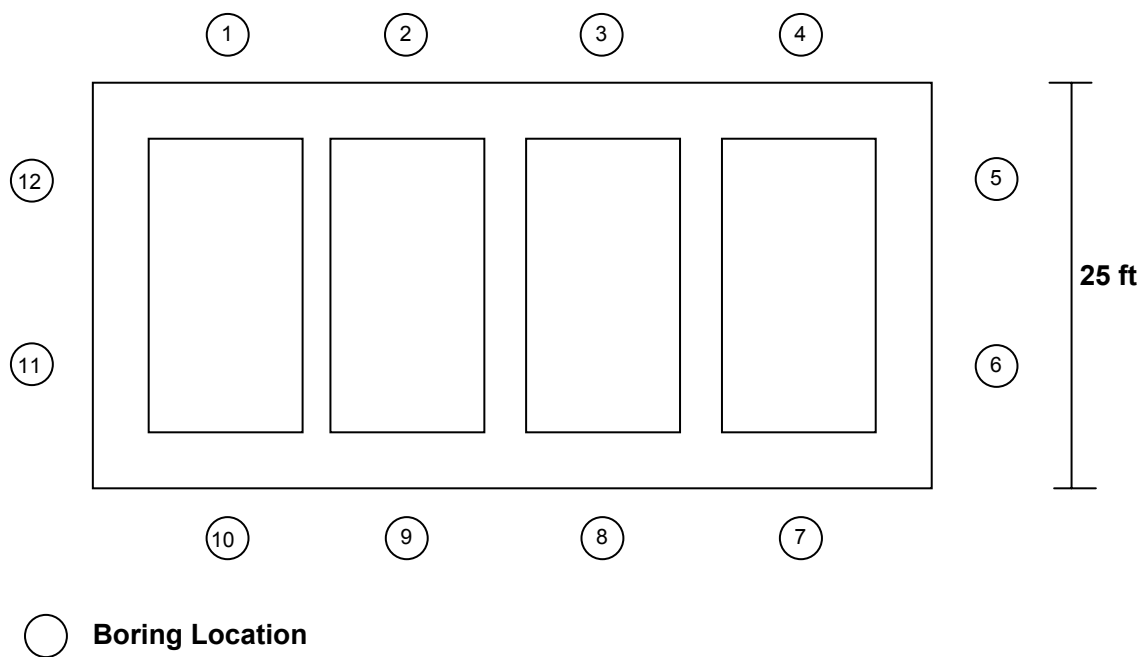
○ **Boring Location**



**Piping Trench**

○ **Boring Location**

**Figure C**  
**Soil Sample Locations - Multiple Tanks Closed in Place**



## Figure D

### Removed Underground Storage Tank(s) Bill of Sale

I \_\_\_\_\_ acknowledge purchase of the following UST(s):

Tank #	Tank Size	Date Tank Removed	All Products Ever Stored in Tank(s)

The above referenced tank(s) was  
removed from the following site:

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

Agency Interest # \_\_\_\_\_

The tank(s) will now be  
located at the following site:

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

Phone# \_\_\_\_\_

The intended use for the tank(s) is: \_\_\_\_\_

**As the new tank(s) owner, I understand that I accept responsibility for the tank(s) and acknowledge that its use will be in compliance with regulatory requirements. I also understand that in accordance with API Recommended Practice 1604, removed underground storage tank(s) must not be used for drainage culverts or the subsequent storage of food or liquids intended for animal or human consumption. I understand that I may become a generator of hazardous waste if and when any remaining residues are removed from the underground storage tank(s).**

New Owner Signature \_\_\_\_\_ Address \_\_\_\_\_

Printed Name \_\_\_\_\_

Date Signed \_\_\_\_\_ Phone # \_\_\_\_\_

## Figure E

### Certification of Empty Tank(s)

This certification, or a comparable document containing the following information, shall be completed and submitted when a removed UST(s) is transported off-site prior to being cut up or destroyed:

Site Name: \_\_\_\_\_

Site Address: \_\_\_\_\_

\_\_\_\_\_

Agency Interest #: \_\_\_\_\_

Number of UST(s) removed: \_\_\_\_\_

I certify that the underground storage tank(s) removed from the above referenced site on \_\_\_\_\_ (date) had all materials from each UST system removed using commonly employed practices so that no more than 2.5 centimeters ( one (1) inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remained in the system when transported off-site from this site on \_\_\_\_\_ (date) and ,therefore, met the definition of empty as per Kentucky Administrative Regulation 401 KAR 42:005.

Signature \_\_\_\_\_

Printed Name \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_